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Identification_Information:
  Citation:
    Citation_Information:
      Originator: NOAA Fisheries Service
      Publication_Date: 20060712
      Title:
        Marsh terracing as a wetland restoration tool for
        creating fishery habitat.
  Description:
    Abstract:
      Terracing uses existing bottom sediments to form
      terraces or ridges at marsh elevation and the intertidal
      zone is planted with marsh vegetation. This study
      examined the habitat value of terracing at Sabine National
      Wildlife Refuge, Louisiana in the spring and fall of 1999
      by quantifying and comparing nekton densities in a 9-yr
      old terrace field and nearby reference area using a 1 m2
      drop sampler.
    Purpose:
      Identify and describe the relationship
      between fishery productivity and the
      coastal environment. Specifically, to examine
      nursery utilization of estuarine marshes by
      fishery species in relation to differences in
      salinity among sites.
  Time_Period_of_Content:
    Time_Period_Information:
      Range_of_Dates/Times:
        Beginning_Date: 19990504
        Ending_Date: 19990920
    Currentness_Reference: ground condition
  Status:
    Progress: complete
    Maintenance_and_Update_Frequency: As necessary
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -93.3837
      East_Bounding_Coordinate: -93.3739
      North_Bounding_Coordinate: 29.8936
      South_Bounding_Coordinate: 29.8865
  Keywords:
    Theme:
      Theme_Keyword_Thesaurus:
      Theme_Keyword: distribution
      Theme_Keyword: abundance
      Theme_Keyword: nursery areas
      Theme_Keyword: restoration
      Theme_Keyword: estuarine dependent
      Theme_Keyword: drop sampler
      Theme_Keyword: nekton
      Theme_Keyword: dredge disposal
      Theme_Keyword: brown shrimp
      Theme_Keyword: white shrimp
      Theme_Keyword: pink shrimp
      Theme_Keyword: Farfantepenaeus aztecus
      Theme_Keyword: Litopenaeus setiferus
      Theme_Keyword: Farfantepenaeus duorarum
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      Theme_Keyword: nursery habitat
      Theme_Keyword: salt marsh
      Theme_Keyword: fish
      Theme_Keyword: terracing
      Theme_Keyword: crabs
      Theme_Keyword: invertebrates
    Place:
      Place_Keyword_Thesaurus: Sabine National Wildlife Refuge
      Place_Keyword: Calcasieu Lake
      Place_Keyword: Louisiana
      Place_Keyword: Gulf of Mexico
  Access_Constraints:
  Use_Constraints:
    These data are not for use in litigation. While efforts have
    been made to ensure that these data are accurate and
    reliable, NOAA cannot assume liability for any or
    damages misrepresentations caused by inaccuracies
    in these data, or as a result of these data being used
    on a particular system. NOAA makes no warranty,
    expressed or implied, nor does distribution constitute
    any such warranty.
  Point_of_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization:
          NOAA Fisheries Service,
          formerly National Marine Fisheries
          Service, Fishery Ecology Branch.
        Contact_Person: Dr. Jim Ditty
      Contact_Address:
        Address_Type: mailing and physical
        Address: Galveston Laboratory, 4700 Avenue U
        City: Galveston
        State_or_Province: Texas
        Postal_Code: 77551-5997
        Country: Unites States of America
      Contact_Voice_Telephone: 409-766-3500
Data_Quality_Information:
  Attribute_Accuracy:
    Attribute_Accuracy_Report:
      Field data were entered into spreadsheets and checked
      against the raw data sheet to avoid entry errors.
  Logical_Consistency_Report:
  Completeness_Report:
  Lineage:
    Process_Step:
      Process_Description:
        Sampling Gear Description:
        The 1.14 m diameter cylindrical drop trap
        was a fiberglass enclosure with a galvanized metal
        skirt along the bottom and sampled a 1-m2 area.
        The drop trap was deployed from a front-mounted
        boom on a boat and pushed into the substrate.
      Process_Date: unknown
    Process_Step:
      Process_Description:
        Measuring Environmental Variables:
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      Environmental data were collected immediately after
      gear deployment and before collection of animals.
      Water temperature, salinity, and D.O. readings were
      collected inside the sampler and a water sample was
      collected and returned to the laboratory for turbidity
      analysis. Water depth was measured with a meter
      stick and recorded to the nearest centimeter.
      Field sheets were checked to ensure all
      required environmental data were recorded correctly.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Sampling of Nekton and Associated Plants:
      The engine was turned off once the boat
      approached the sampling site to minimize site
      disturbance prior to sampling. The boat drifted or
      was slowly guided to the sampling site by pushing
      from the stern. Immediately after drop sampler
      deployment, field personnel pushed the sampler
      approximately 15 cm into the sediment to obtain a
      proper seal along the bottom of the trap to prevent
      escape of organisms via a trap blow-out. If the
      sample was taken in a marsh, vascular plant stems
      enclosed in the sampler were clipped at ground
      level and counted. If submerged aquatic vegetation
      was present, percent coverage was estimated
      and the plants identified to species.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Removal of Animals:
      DROP TRAPS:
      After the drop trap was pushed into the substrate,
      dip nets were used to sweep the bottom of the
      trap and remove nekton. Enclosed water was
      pumped from the trap and filtered through a 1 mm
      mesh plankton net. As the water level dropped, the
      sampler was continually swept with dip nets
      because the efficiency of animal capture increases
      as water depth is reduced. Once drained, the
      sediment was visually and manually inspected for
      animals remaining on or burrowed into the
      substrate. Animals taken in dip nets or found during
      substrate inspection were added to the catch.
      Nekton and other material (i.e., vegetation,
      macro-algae, shell hash, and detritus) pumped into
      the cod end of the plankton net were rinsed and the
      cod-end catch bag detached. Samples were placed
      in a 1 mm mesh bag, labeled, fixed, and
      returned to the laboratory for processing.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Care of Nekton Samples in the Field:
      Labeled tags were placed inside and attached
      to the outside of each 1-mm mesh sample bag.
      Samples were stored in 3 or 5 gallon buckets
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      containing ten percent formalin, which was made by
      mixing one part full-strength formaldehyde with
      nine parts water. If animals were too large to
      fit into the sample bag, the specimen was
      identified to the lowest taxon, measured,
      recorded, and released.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Initial Processing of Field Data and Samples:
      After returning from the field, samples were
      recorded in the laboratory log book. Turbidity samples
      were analyzed upon return to the laboratory and the
      information transferred to the field data sheets.
      Field data sheets were entered into an electronic
      database or a database manager, checked, and a
      printout was given to the laboratory supervisor and
      primary investigator for review.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      SPECIES IDENTIFICATION and MEASUREMENT:
      Specimens were identified and the species name was
      recorded on the appropriate identification sheet.
      Fish were measured to the nearest millimeter
      total length (TL). TL and carapace length (CL) were
      measured for penaeid shrimp, and carapace width (CW)
      for crabs. TL in shrimp was from the tip of the
      rostrum to the tip of telson. If the rostrum was
      broken, "broken rostrum" was recorded on the data
      sheet and TL was not measured. Carapace width
      (CW) of crabs was measured across the widest
      part of the carapace (from tip to tip of the lateral
      spines, if present). If lateral spines were broken,
      "broken lateral spines" was recorded on the data
      sheet for that individual and CW was not measured.
      Hermit crabs were not measured.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Preservation and Storage of Fish and Invertebrates:
      After sorting and identification, organisms were
      preserved in 70 percent ETOH (i.e., mixture of 7.4
      parts of 95 percent ETOH and 2.6 parts water) and
      samples were kept for at least 5 years.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Measuring Biomass of Animals:
      Wet weight (g) was recorded by taxon for each sample.
    Process_Date: unknown
  Process_Step:
    Process_Description:
      Organism Data Entry and Validation:
      Laboratory and field data were entered into the
      computer using a database manager. A text file was
      created that described these data and any
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        abbreviated variables. Data were printed out,
        checked against ID sheets and corrections were made
        at that time. A species ID code was assigned to each
        individual using the Fishery Ecology Branch revised
        species code list. A species not found on the code
        list was assigned a new code, which was added to
        the master list.
      Process_Date: unknown
Entity_and_Attribute_Information:
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: Descriptive Terms for Study Sites
      Entity_Type_Definition: Terms Defining Study Sites
      Entity_Type_Definition_Source:
        NOAA Fisheries Service,
        Fishery Ecology Branch, Galveston, Texas
    Attribute:
      Attribute_Label: General Habitat Descriptor
      Attribute_Definition: General description of habitats sampled
      Attribute_Definition_Source:
        NOAA Fisheries Service,
        Fishery Ecology Branch, Galveston, Texas
      Attribute_Domain_Values:
        Enumerated_Domain:
          Enumerated_Domain_Value: Terrace marsh edge
          Enumerated_Domain_Value_Definition:
            Intertidal Spartina marsh, created
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
        Enumerated_Domain:
          Enumerated_Domain_Value: Reference marsh edge
          Enumerated_Domain_Value_Definition:
            Natural or created Spartina marsh
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
        Enumerated_Domain:
          Enumerated_Domain_Value: Terrace pond
          Enumerated_Domain_Value_Definition:
            Subtidal, open water pond
            with nonvegetated mud bottom, created
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
        Enumerated_Domain:
          Enumerated_Domain_Value: Reference pond
          Enumerated_Domain_Value_Definition:
            Subtidal, open water pond
            with natural nonvegetated mud bottom
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
    Attribute:
      Attribute_Label: Sites
      Attribute_Definition: Locations within each sampled habitat
      Attribute_Definition_Source:
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        NOAA Fisheries Service, Fishery Ecology Branch,
        Galveston, Texas
      Attribute_Domain_Values:
        Enumerated_Domain:
          Enumerated_Domain_Value: Cell
          Enumerated_Domain_Value_Definition:
            Within a created terrace embankment (either
            Spartina marsh edge or open water pond)
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
        Enumerated_Domain:
          Enumerated_Domain_Value: Pond
          Enumerated_Domain_Value_Definition:
            Natural open water or inside a terrace
            embankment (either vegetated or nonvegetated bottom)
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
        Enumerated_Domain:
          Enumerated_Domain_Value: Marsh
          Enumerated_Domain_Value_Definition:
            Natural or created Spartina marsh edge
            or terrace marsh edge
          Enumerated_Domain_Value_Definition_Source:
            NOAA Fisheries Service, Fishery Ecology Branch,
            Galveston, Texas
Metadata_Reference_Information:
  Metadata_Date: 20060712
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization:
          NOAA Fisheries Service, Fishery Ecology Branch,
          Galveston, Texas
        Contact_Person: Dr. Jim Ditty
      Contact_Address:
        Address_Type: mailing and physical
        Address: Galveston Laboratory, 4700 Avenue U
        City: Galveston
        State_or_Province: Texas
        Postal_Code: 77551-5997
        Country: Unites States of America
      Contact_Voice_Telephone: 409-766-3500
  Metadata_Standard_Name:
    FGDC Content Standard
    for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001.1-1999
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